

**Before the JOINT COMMITTEE MEETING**

**Senate Committee on Natural Resources and Environmental Affairs  
House Committee on Natural Resources, Great Lakes, Land Use and Environment**

**Hearing on *Impact of Beach Grooming under PL 14, 2003***

**Testimony of Dr. Donald Scavia  
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Thank you Madame and Mr. Chairman, and members of both Committees, for the opportunity to present testimony on the scientific basis of actions related to beach grooming in Michigan. My name is Dr. Donald Scavia and I am Professor and Associate Dean at the University of Michigan's School of Natural Resources and Environment, as well as Director of the Michigan Sea Grant Program. My testimony focuses on the results of an independent technical peer review, conducted by Michigan Sea Grant, of two related reports commissioned by the Michigan Department of Environmental Quality.

Part 303, Wetlands Protection, and Part 325, Great Lakes Submerged Lands, of the Natural Resources and Environmental Protection Act were amended in 2003 by Public Act 14 to streamline authorizations for beach maintenance and vegetation removal activities between the ordinary high water mark of the Great Lakes and the water's edge. Recognizing that there are ecological concerns associated with alteration of coastal wetlands, and realizing that low water levels are not a permanent condition, the Legislature placed both geographic and time limits on the provisions of Act 14. Moreover, the Department of Environmental Quality (DEQ) was required to evaluate the impacts of vegetation removal and report back to the Governor and the Legislature. The Department of Environmental Quality commissioned three university-based scientists<sup>1</sup> to study and document, if any, the impact of activities carried out under PL 14. The scientists examined impacts on vegetation, chemical/physical conditions and biotic communities – macroinvertebrates and fishes.

I will not repeat the detailed findings of the two reports here, other than to indicate that the vegetation study found that bulrush, one of the most characteristic plants found in shallow waters of both Saginaw and Grand Traverse Bays, was almost non-existent where raking, hand-pulling, or sand-filling had occurred; and that rhizome and root mass of the plants in untreated and mowed plots remained strong and intact, while those in

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<sup>1</sup> Dr. Donald Uzarski, Assistant Professor and Research Scientist, Annis Water Resources Institute, Grand Valley State University. Dr. Thomas Burton, Professor, Departments of Zoology and Fisheries and Wildlife, Michigan State University. Dr. Dennis Albert, Research Ecologist, Michigan Natural Features Inventory, Michigan State University Extension.

more heavily managed plots, especially raked or sand-filled plots, had partially or wholly decomposed over the study period. They also found that plant species diversity was significantly higher in unmanaged and mowed sites compared to raked, hand-pulled, and sand-filled sites. The impacts on fish and invertebrate were even stronger. Bringing open lake water into previously vegetated habitats, through raking, disrupted the ambient chemical and physical conditions that are integral to habitat value, as well as significantly decreased the abundance and diversity of invertebrates and fish; mowing has less of an impact.

Ultimately, policies put in place with respect to the management of exposed bottom lands will have to consider social and economic, as well as environmental aspects. However, because the environmental science base for this decision depends largely on the studies commissioned by the DEQ, Michigan Sea Grant (MSG) offered to conduct an independent peer review of the reports.

### **Independent Peer Review**

Peer review is a scholarly process used to assess the quality of scientific research and ensure researchers meet the standards of quality and objectivity of their discipline. Because individual scholars are generally expert in limited areas, the peer review process is considered critical – to some, the gold standard -- to establishing a reliable body of research and knowledge. Scholars rely on the peer-review process to provide reliable and credible research upon which they can build subsequent or related research. Similarly, policy makers should rely on peer review to ensure they have the best available science base for decisions.

To conduct the review, MSG selected six scientists, three to review each of the two reports. Neither the original authors nor the DEQ had any influence on the selection of those six reviewers, and they will remain anonymous because reviewer anonymity and independence ensures unfettered criticism and discourages unwarranted support from close colleagues. However, we can report that the six reviewers cumulatively have over 180 years of related scientific experience and have published over 290 papers in the peer-reviewed literature on relevant research topics. Also, in addition to my current positions at the University of Michigan, I am Associate Editor for scientific journals of the Estuarine Research Federation and the Ecological Society of America, and therefore very familiar with the role and procedures of peer review and scientific assessment. As an individual with over 30 years of research and research management experience, as well as almost 10 years of experience in conducting peer reviews for two prestigious journals, I am confident that the peer review process used for this evaluation meets all standards of scholarly review and evaluation.

We asked each of the reviewers to assess the following aspects of the reports:

- Are the report's conclusions and interpretations valid?
- Are the methods appropriate, current, and described clearly enough that the work could be repeated by someone else?

- Do the data support the conclusions of the authors? Is this a complete study or a preliminary note? Do the authors speculate enough or too much?
- Is opinion clearly distinguished from fact? Should other sides of an argument be presented?
- Are the data clearly presented? Is the writing concise and understandable? Are the experimental or sampling design conveyed clearly? Are other details needed before a reader can reproduce the results?
- When results are stated in the text of the paper, can you easily verify them by examining tables and figures? Are any of the results counterintuitive?
- Are the statistical design and analysis appropriate and correct? Is it possible to clearly discern which measurements or observations are independent of which other measurements or observations? Are replicates correctly identified? Are significance statements justified?
- Are all pertinent references cited? Are they provided for all assertions of fact not supported by the data in this paper?

## Review Results

***Vegetation Study:*** Overall, the reviewers regard the report's conclusions and interpretations as valid, within the limitations stated by the author, and based on the data presented and species characteristics. Generalizations in the summary are clear, valid, and supported by the research results. One reviewer was not sure there was enough clarity, especially in the methods and figures, to duplicate the study; however, the general sense of the reviews was that the report is balanced, without undue speculation, and it acknowledged technical problems encountered when they occurred. The sampling design is well documented; two reviewers agreed with statistical design/analyses, while the third reviewer stresses that a more detailed presentation of the study design and statistical treatments would allow more concrete conclusions.

***Fish, Invertebrate, and Chemistry Study:*** Overall, the reviewers felt the study's design, implementation, and interpretation met all reasonable standards of scientific rigor. On balance, the conclusions are valid, driven by data, unbiased, and not overstated. However, one reviewer suggested the authors may have speculated a bit on the impacts on nearshore fish communities and that fish diet data would have strengthened the arguments. The reviewers and authors also recognized that the particular gear used for fish studies may produce results that are difficult to interpret because of chance catches (e.g. of rare species) and schools.

The experimental design was developed to maximize the ability to detect effects of all management activities, mowing raking, hand-pulling and sand-filling if they existed. Two of the three reviewers praised the experimental design, with one being concerned that some of the statistical techniques employed were less powerful than available. Consequently, in this reviewer's opinion, conclusions about the degree and type of impact of one management activity, mowing, may be underestimated. In addition, given the variability among wetlands, more powerful statistical techniques may have detected stronger effects. However, the authors took care to block or pair-match wetlands to

account for such variability in their experimental design and the statistical design used here is typical of these kinds of studies. As always, given the number of variables, more sample sites would have helped the analysis.

***Summary of the Reviews:*** While reviewers pointed out that the experimental design was less than ideal (as usually is the case with relatively uncontrolled field experiments) and that, in some cases, there are perhaps more powerful ways to analyze the data, the overall sense of the reviews was that the methods in both reports were sound, the data support the authors findings and conclusions, and the interpretations were unbiased. In these studies and reviews, as in almost all such cases, there is not uniform agreement among scientists on the best way to perform experiments or test for differences in treatments, particularly in field studies. So, the reviewers do suggest additional analysis and approaches for further study of continuing impacts. These suggestions do not, however, detract from the validity of the findings in the two reports.

## **Conclusion**

As stated earlier in this testimony, the policies put in place with respect to the management of exposed bottom lands will have to consider social and economic, as well as environmental aspects. The two reports addressed in this review form a solid basis for the environmental impacts, and the thorough and independent review of the methods, results, and interpretation of those studies validate their conclusions.

I appreciate the opportunity to review those results with you today and will be pleased to answer any questions you may have regarding the review process or the results.